CLEAN COPY OF CLAIMS

1. A process for producing a corrosion- and wear-resistant layer on a substrate by spraying on an iron oxide-based material, characterised in that the iron oxide-based material which has at least 20% by weight and preferably more than 30% by weight of magnetite (Fe_3O_4 and/or Fe_2O_4) is applied by on-line controlled plasma spraying, in particular high-speed flame spraying, or plasma spraying, in particular plasma spraying in air or vacuum, high-power plasma spraying (HPPS), shroud plasma spraying (SPS), by on-line controlled wire flame spraying or arc wire spraying, and in that operation the layer of the material is monitored by an on-line monitoring and control system.

2. A process as set forth in claim 1 characterised by on-line monitoring and control by means of an ITG-camera (18) directed on to the spray jet (10), an LDA-detector (20) with LDA-laser (22) and an HSP-head (24) (Figure 1).

3. (Amended) A process as set forth in claim 1 characterised by on-line monitoring and control by measurement of the particle speed in the spray flame.

4. (Amended) A process as set forth in claim 1 characterised by on-line monitoring and control by means of measurement of the particle speed in the spray flame by a laser Doppler anemometer by means of a beam (60) which is emitted from a laser device (62) and which is divided into two partial beams (60_a, 60_b) by an optical transmission system (64) (Figure 6).

5. (Amended) A process as set forth in claim 1 characterised by on-line monitoring and control by measurement of the particle speed in the spray flame by means of a high-speed pyrometer.

6. (Amended) A process as set forth in claim 1 characterised by on-line monitoring and control in which the particle temperature in the spray flame is measured by means of infra-red thermography (Figure 3).

7. A process as set forth in claim 1 characterised by on-line monitoring and control in which the measured amount of gas is analysed.

8. (Amended) A process as set forth in claim 1 characterised by on-line monitoring and control in which a measured amount of plasma gas is analysed.

9. A process as set forth in claim 1 characterised by on-line monitoring and control in which a measured current-voltage characteristic is evaluated.

10. A process as set forth in claim 1 characterised by on-line monitoring and control in which an amount of powder fed to the spray flame is measured.

11. (Amended) A process for producing a corrosion- and wear-resistant layer as set forth in claim 1 characterised by an on-line controlled plasma spray process in which air is used as the plasma gas.

12. (Amended) A process for producing a corrosion- and wear-resistant layer as set forth in claim 1 characterised in that an on-line controlled, water-stabilised plasma spray process is used as the coating process.

13. (Amended) A material for producing a corrosion- and wear-resistant layer on a substrate by thermal spraying, by a process as set forth in claim 1 characterised in that it has at least 20% by weight, preferably more than 30% by weight, of magnetite (Fe_3O_4 and/or $FeFe_2O_4$).

14. A material as set forth in claim 13 characterised in that characterised in that it comprises pure magnetite.

15. A material as set forth in claim 13 characterised in that it comprises magnetite and at least one further metallic material.

16. A material as set forth in claim 13 characterised in that it comprises magnetite and at least one intermetallic compound.

17. A material as set forth in claim 13 characterised by an addition of carbide or carbides or nitride or nitrides or silicide or silicides or boride or borides or oxide or oxides.

18. A material as set forth in claim 13 characterised by the addition of a mixture of metals, intermetallic compounds, carbides, nitrides, silicides, borides and/or oxides.

19. A material as set forth in claim 15 characterised by magnetite and an addition of up to 50% by weight, preferably up to 40% by weight, of Cr, CrNi or a ferritic steel.

20. (Amended) A material as set forth in claim 13 characterised in that it comprises magnetite and carbides of W, Cr, Mo, Nb, Ta, Ti or V.

21. A material as set forth in claim 20 characterised in that it comprises magnetite with an addition of up to 30% by weight, preferably up to 20% by weight, of tungsten and/or chromium carbides.

22. (Amended) A material as set forth in claim 13 characterised by a mixture of magnetite and chromium oxide.

23. A material as set forth in claim 22 characterised by a proportion of the chromium oxide of between 1 and 40% by weight and preferably between 5 and 30% by weight.

24. (Amended) A material as set forth in claim 13 characterised by a grain size of the powder spray material of between 0.05 and 150 µm, preferably between 0.1 and 120 µm.

25. (Amended) A material as set forth in claim 13 characterised by a filling wire in the form of wire spray material whose filling comprises magnetite and whose sheath comprises an alloy.

26. (Amended) A material as set forth in claim 13 characterised by a powder grain with good flow properties, which is produced from the powder material mixture by spray drying.

27. (Amended) A material as set forth in claim 13 characterised by a powder grain which is resistant to separation of its mixture and which is produced from the powder material mixture by means of an agglomeration process.

AMENDED CLAIMS

3. (Amended) A process as set forth in claim 1 [or claim 2] characterised by on-line monitoring and control by measurement of the particle speed in the spray flame.

4. (Amended) A process as set forth in claim 1 [or claim 3] characterised by on-line monitoring and control by means of measurement of the particle speed in the spray flame by a laser Doppler anemometer by means of a beam (60) which is emitted from a laser device (62) and which is divided into two partial beams (60_a, 60_b) by an optical transmission system (64) (Figure 6).

5. (Amended) A process as set forth in claim 1 [or claim 3] characterised by on-line monitoring and control by measurement of the particle speed in the spray flame by means of a high-speed pyrometer.

6. (Amended) A process as set forth in [one of claims 1 and 5] claim 1 characterised by on-line monitoring and control in which the particle temperature in the spray flame is measured by means of infra-red thermography (Figure 3).

8. (Amended) A process as set forth in [one of claims 1 and 7] claim 1 characterised by on-line monitoring and control in which a measured amount of plasma gas is analysed.

11. (Amended) A process for producing a corrosion- and wear-resistant layer as set forth in [one of claims 1 through 10] claim 1 characterised by an on-line controlled plasma spray process in which air is used as the plasma gas.

12. (Amended) A process for producing a corrosion- and wear-resistant layer as set forth in [one of claims 1 through 10] claim 1 characterised in that an on-line controlled, water-stabilised plasma spray process is used as the coating process.

13. (Amended) A material for producing a corrosion- and wear-resistant layer on a substrate by thermal spraying, by a process as set forth in [one of claims 1 through 12] claim 1 characterised in that it has at least 20% by weight, preferably more than 30% by weight, of magnetite (Fe_3O_4 and/or $FeFe_2O_4$).

20. (Amended) A material as set forth in claim 13 [or claim 17] characterised in that it comprises magnetite and carbides of W, Cr, Mo, Nb, Ta, Ti or V.

22. (Amended) A material as set forth in claim 13 [or claim 17] characterised by a mixture of magnetite and chromium oxide.

24. (Amended) A material as set forth in [one of claims 13 through 23] claim 13 characterised by a grain size of the powder spray material of between 0.05 and 150 µm, preferably between 0.1 and 120 µm.

25. (Amended) A material as set forth in [one of claims 13 through 23] claim 13 characterised by a filling wire in the form of wire spray material whose filling comprises magnetite and whose sheath comprises an alloy.

26. (Amended) A material as set forth in [one of claims 13 through 25] claim 13 characterised by a powder grain with good flow properties, which is produced from the powder material mixture by spray drying.

27. (Amended) A material as set forth in [claims 13 through 15] claim 13 characterised by a powder grain which is resistant to separation of its mixture and which is produced from the powder material mixture by means of an agglomeration process.